Amendments to the Specification and Abstract

Please replace paragraph beginning on page 3, line 25, with the following rewritten paragraph:

It is therefore ~~the~~ an object of the present invention to ~~propose~~ provide a method for scanning ~~microscope~~ microscopy that makes possible online observation of a specimen, reliably and with minimum information loss, even when large quantities of spectral data are being generated simultaneously.

Please replace paragraph beginning on page 4, line 3, with the following rewritten paragraph:

The ~~object is achieved by way of~~ present invention provides a method comprising the steps of:

- illuminating a specimen that contains at least one fluorescent dye, using illuminating light;
- detecting the detection light proceeding from scan points of the specimen, using a spectral detector that generates spectral data for each scan point;
- determining from the spectral data an amplitude value for each fluorescent dye; and
- transferring the amplitude values to a processing module.

Please replace paragraph beginning on page 4, line 12, with the following rewritten paragraph:

It is a further object of the invention to ~~describe~~ provide a scanning microscope with which online observation of a specimen is reliably possible even when large quantities of spectral data are being generated simultaneously.

Please replace paragraph beginning on page 4, line 15, with the following rewritten paragraph:

~~This object is achieved by way of~~ The invention also provides a scanning microscope comprising:

a light source that emits illuminating light for illumination of a specimen that contains at least one fluorescent dye, a scanning device for scanning scan points of the specimen, a spectral detector for detecting the detection light proceeding from the scan points, the spectral detector generating spectral data for each scan point, a module for determining, from the spectral data, an amplitude value for each fluorescent dye; and means for transferring the amplitude values to a processing module.

Please delete the eight (8) paragraphs from the paragraph beginning on page 5, line 12, through the paragraph beginning on page 6, line 22.

Before the paragraph beginning on page 7, line 6, please insert the following new paragraphs:

-- In an embodiment, the spectral detector encompasses a grating spectrometer or prism spectrometer, or preferably a multiband detector.

In another embodiment, the illuminating step encompasses a scanning of the scan points of the specimen with illuminating light, in particular with the focus of an illuminating light beam. The latter can, for example, be guided in meander fashion over or through the specimen. It is also possible to illuminate the specimen in large-area fashion (not by scanning), and to perform the allocation of spectral data to scan points by means of scanning detection, which can be achieved particularly effectively using confocal arrangements.

In an embodiment, the scanning occurs sequentially. In another variant, the scanning is accomplished at least partially simultaneously or line-by-line.

Another embodiment of the method encompasses the further step of determining from the spectral data the at least one fluorescent dye contained in the specimen. In an embodiment,

this can encompass a comparison of the spectral data to reference data stored in a memory module for various fluorescent dyes. The reference data are prepared on the basis of the known emission spectra of the fluorescent dyes, and stored in the memory module. The reference data can, for example, be stored in the memory module upon manufacture or, depending on the application, individually loaded into the memory module by the user or automatically. If no reference data are available for the emission spectrum of a (for example, exotic) fluorescent dye, those data can be determined during the measurement and can be added to the reference data for future investigations, so that at the next occurrence of comparable spectral data for a pixel, all that is necessary is to access the reference data. The comparison of the spectral data to the reference data preferably encompasses a minimization of the sums of the error squares.

In an embodiment, the method encompasses, after transfer, the further step of reconstructing the spectral data in the processing module from the transferred amplitude values. This is possible using simple computation operations, since the type of data reduction on the basis of the reference data, and the reference data themselves, are known to the processing module.

In another embodiment, the deviation of the measured spectral data from the corresponding reference signal is also transferred to the processing module as additional information from which conformity can be evaluated. The additional information can contain, for example, the sum of the error squares.

The method is advantageous both in multi-point scanners and line scanners, and also in very fast single-point scanners, especially for continuous scans; and also in the context of transfer via data networks, for example the Internet.

In an embodiment, the scanning microscope is a confocal scanning microscope.--